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KIKUTA YOSHIO**(54) PHOTO-SETTING TYPE RESIN COMPOSITION FOR SEALING MATERIAL, AND METHOD OF SEALING****(57)Abstract:**

PROBLEM TO BE SOLVED: To obtain a photo-setting type resin composition for sealing materials excellent in photosensitivity and quick curability and good in adhesion and water vapor transmission, water and heat resistances.

SOLUTION: This photo-setting type resin composition for sealing materials comprises (A) a compound having an oxetane ring, (B) a photocationic initiator, (C) a silane coupling agent and (D) an inorganic ion exchanger and has a viscosity at 25° C within the range of 0.01–300 Pa.s. The composition preferably comprises either one or both of (E) a fine particulate silica and (F) a compound having epoxy group. The contents of the components in the resin composition are preferably 50–90 pts.wt. of the component (A), 0.3–3 pts.wt. of the component (B), 0.3–20 pts.wt. of the component (C), 1–10 pts.wt. of the component (D), 1–30 pts.wt. of the component (E) and 1–50 pts.wt. of the component (F).

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CLAIMS

[Claim(s)]

[Claim 1] (A) The photo-curing mold resin constituent for sealants which contains the compound which has an oxetane ring, (B) light cation initiator, the (C) silane coupling agent, and the (D) inorganic ion exchanger, and is characterized by the viscosity of 25 degrees C being the range of 0.01 thru/or 300 Pa-s.

[Claim 2] The photo-curing mold resin constituent for sealants according to claim 1 with which said photo-curing mold resin constituent for sealants is characterized by containing (E) particle silica.

[Claim 3] The photo-curing mold resin constituent for sealants according to claim 1 or 2 characterized by said photo-curing mold resin constituent for sealants containing the compound which has the (F) epoxy group.

[Claim 4] The liquid crystal or the sealing compound for electroluminescence displays characterized by using the photo-curing mold resin constituent for sealants given in any 1 term claim 1 thru/or among 3.

[Claim 5] The seal approach characterized by carrying out liquid crystal or the seal of an electroluminescence display using the photo-curing mold resin constituent for sealants according to claim 4.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the photo-curing mold resin constituent for sealants which consists of a compound which has an oxetane ring, the seal approach and the obtained liquid crystal, or an electroluminescence display.

[0002]

[Description of the Prior Art] In recent years, development of the flat-panel display which used various display devices in an electron and the electric industry, and manufacture are performed. Many of these displays close a display device in cells, such as glass and plastics. As the representative, a liquid crystal (LC) display and an electroluminescence (EL) display are mentioned. A liquid crystal display usually encloses liquid crystal for two glass lamination and into it by the sealant. Conventionally, the heat-curing mold epoxy resin has been used for a sealant. However, heat hardening needed to be carried out for about 2 hours at the elevated temperature of 150 degrees C - 180 degrees C, and there was a problem that productivity did not go up. On the other hand, an EL display is excellent in respect of high brightness, efficient, high-speed responsibility, etc., and attracts attention as a next-generation flat-panel display. There are an inorganic EL element and an organic EL device in a component, and the inorganic EL element is put in practical use with the back light of a clock etc. Although the organic EL device is excellent in respect of [EL element / inorganic] high brightness, efficient, high-speed responsibility, and multiple-colorizing, thermal resistance is low and heat-resistant temperature is about 60-80 degrees C. For this reason, in the seal of an organic electroluminescence display, there was a problem which cannot fully carry out heat hardening with a heat-curing mold epoxy resin. In order to solve these problems, examination of the photo-curing mold sealant in which low-temperature fast hardening is possible is performed. A photo-curing mold sealant is roughly divided and has an optical radical hardening mold sealant and an optical cation-hardening mold sealant. Although the optical radical hardening mold sealant had the advantage that various acrylate monomers and oligomer could be used, its rate of volumetric shrinkage was large, and it had the problem that adhesive strength was low. On the other hand, although the optical cation hardening mold sealant had the good adhesive property, photosensitivity, fast curability, and moisture permeability-proof were not enough. It is because this had the demerit in which the epoxy resin and vinyl ether which have been used until now had a slow cure rate, and molecular weight did not go up. Moreover, the application of the above displays is greatly used for the display for bread mount etc., is stabilized also in the conditions of high-humidity/temperature Shimo etc. for a long period of time, and an usable thing is also desired increasingly in recent years. Since a cation initiator was used for the bottom of such a condition at an initiator, the ionicity impurity remained in the system, and the ITO electrode layer might be corroded and it might have a bad influence, such as being eluted in liquid crystal mix CHUA and disturbing orientation.

[0003]

[Problem(s) to be Solved by the Invention] It excels in both an adhesive property photosensitivity fast curability and moisture permeability-proof, productivity is also good, and it is in the elution of an ionicity impurity offering little liquid crystal, the suitable sealing compound for all of an electroluminescence display, and the seal approach.

[0004]

[Means for Solving the Problem] As a result of inquiring wholeheartedly, this invention persons the trouble which the conventional photo-curing mold resin constituent for sealants had (A) The compound which has an oxetane ring, (B) light cation initiator, the (C) silane coupling agent, (D) by consisting of an inorganic ion exchanger, consisting of a compound which has (E) particle silica and the (F) epoxy group if needed, and other additives, and using the sealant photo-curing mold resin constituent which is the specific viscosity range Photosensitivity, fast curability, an adhesive property, moisture permeability-proof, a water resisting property, and thermal resistance are good, and find out that the elution of an ionicity impurity can realize few photo-curing mold resin constituents for sealants, and it came to complete this invention. That is, following the (1) - (5) is offered.

- (1) The photo-curing mold resin constituent for sealants which contains the compound which has (A) oxetane ring, (B) light cation initiator, the (C) silane coupling agent, and the (D) inorganic ion exchanger, and is characterized by the viscosity of 25 degrees C being the range of 0.01 thru/or 300 Pa-s.
- (2) The photo-curing mold resin constituent for sealants given in (1) with which said photo-curing mold resin constituent for sealants is characterized by containing (E) particle silica.
- (3) (1) characterized by said photo-curing mold resin constituent for sealants containing the compound which has the (F) epoxy group, or the photo-curing mold resin constituent for sealants given in (2).

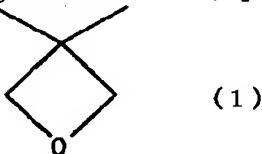
(4) The liquid crystal or the sealing compound for electroluminescence displays characterized by using the photo-curing mold resin constituent for sealants of a publication for either among (1) thru/or (3).

(5) The seal approach characterized by making liquid crystal or the seal of an electroluminescence display (4) using the photo-curing mold resin constituent for sealants of a publication.

[0005]

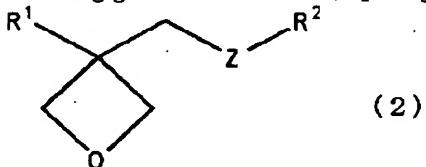
[Embodiment of the Invention] Hereafter, this invention is explained to a detail.

[0006] the compound (A) which has an oxetane ring in [compound which has (A) oxetane ring] this invention — a general formula — (1 [-izing 1]) — [Formula 1]



Either can be used if it is the compound which has at least one oxetane ring expressed. for example, 1 thru/or the compound contained 15 times mention an oxetane ring — having — desirable — 1 thru/or the compound contained ten times — they are 1 thru/or the compound contained four times especially preferably.

[0007] Although either can be used if it is the compound which has one oxetane ring as a compound which has one <compound which has one oxetane ring> oxetane ring, the following compound can use suitably. for example, the following general formula — (2 [-izing 2]) — [Formula 2]

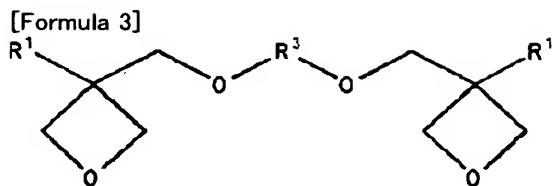


It comes out and the compound shown is mentioned. In a general formula (2), Z, R1, and R2 mean a following atom or a following substituent. Z shows an oxygen atom or a sulfur atom. R1 is the aryl group, furil radical, or thiényl group of the carbon numbers 6-18, such as a fluoro alkyl group of 1-6 carbon atomic numbers, such as an alkyl group of 1-6 carbon atomic numbers, such as a hydrogen atom, a fluorine atom, a methyl group, an ethyl group, a propyl group, and butyl, a trifluoromethyl radical, a perfluoro methyl group, a perfluoro ethyl group, and a perfluoro propyl group, a phenyl group, and a naphthyl group. R2 The alkyl group of 1-6 carbon atomic numbers, such as a hydrogen atom, a methyl group, an ethyl group, a propyl group, and butyl, 1-propenyl radical, 2-propenyl radical, a 2-methyl-1-propenyl radical, A 2-methyl-2-propenyl radical, 1-butenyl group, 2-butenyl group, The alkenyl radical of 2-6 carbon atomic numbers, such as 3-butenyl group; Benzyl, Fluoro benzyl, METOSHIKI benzyl, a phenethyl radical, a styryl radical, Permutations, such as a cinnamyl radical and an ethoxybenzyl radical, or the aralkyl radical of the unsubstituted carbon atomic numbers 7-18; A phenoxyethyl radical, The radical which has the ring of others, such as aryloxy alkyl groups, such as a phenoxy ethyl group; An ethyl carbonyl group, The alkyl carbonyl group of 2-6 carbon atomic numbers, such as a propylcarbonyl radical and a butyl carbonyl group; An ethoxycarbonyl radical, The alkoxy carbonyl group of 2-6 carbon atomic numbers, such as a propoxy carbonyl group and a butoxycarbonyl radical; An ethyl carbamoyl group, N-alkyl carbamoyl group of 2-6 carbon atomic numbers, such as a propyl carbamoyl group, a butylcarbamoyl radical, and a pentyl carbamoyl group, is mentioned. Moreover, substituents other than the above may be used in the range which does not check the effectiveness of the invention in this application.

[0008] As a more concrete example of the compound which has one oxetane ring 3-ethyl-3-hydroxymethyloxetane, 3-(meta) allyloxy methyl-3-ethyl oxetane, Methylbenzene, 4-fluoro-[1-(3-ethyl-3-OKISETA nil methoxy) methyl] benzene, (3-ethyl-3-OKISETA nil methoxy) 4-methoxy-[1-(3-ethyl-3-OKISETA nil methoxy) methyl] benzene, [1-(3-ethyl-3-OKISETA nil methoxy) ethyl] Phenyl ether, The iso butoxy methyl (3-ethyl-3-OKISETA nil methyl) ether, The isobornyl oxy-ethyl (3-ethyl-3-OKISETA nil methyl) ether, The isobornyl (3-ethyl-3-OKISETA nil methyl) ether, the 2-ethylhexyl (3-ethyl-3-OKISETA nil methyl) ether, The ethyl diethylene-glycol (3-ethyl-3-OKISETA nil methyl) ether, The dicyclopentadiene (3-ethyl-3-OKISETA nil methyl) ether, The JISHIKURO pentenyl oxy-ethyl (3-ethyl-3-OKISETA nil methyl) ether, The JISHIKURO pentenyl ethyl (3-ethyl-3-OKISETA nil methyl) ether, The tetrahydrofurfuryl (3-ethyl-3-OKISETA nil methyl) ether, The tetrabromo phenyl (3-ethyl-3-OKISETA nil methyl) ether, The 2-tetrabromo phenoxy ethyl (3-ethyl-3-OKISETA nil methyl) ether, The TORIBUROMO phenyl (3-ethyl-3-OKISETA nil methyl) ether, 2-TORIBUROMO phenoxy ethyl (3-ethyl-3-OKISETA nil methyl) ether, 2-hydroxyethyl (3-ethyl-3-OKISETA nil methyl) ether, 2-hydroxypropyl (3-ethyl-3-OKISETA nil methyl) ether, The butoxy ethyl (3-ethyl-3-OKISETA nil methyl) ether, The pentachlorophenyl (3-ethyl-3-OKISETA nil methyl) ether, the pentabromophenyl (3-ethyl-3-OKISETA nil methyl) ether, the bornyl (3-ethyl-3-OKISETA nil methyl) ether, etc. are mentioned.

[0009] as the compound which has a <compound which has two oxetane rings> 2 piece oxetane ring — the following general formula — (3 [-izing 3]) and a general formula — the compound shown by (8 [-izing 8]) is mentioned.

[0010] (Compound expressed with a general formula (3)) a general formula — the compound expressed with (3 [-izing 3]) is as follows.

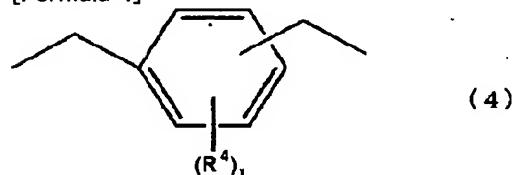


(3)

R1 is the aryl group, furil radical, or thienyl group of the carbon numbers 6–18, such as a fluoro alkyl group of 1–6 carbon atomic numbers, such as an alkyl group of 1–6 carbon atomic numbers, such as a hydrogen atom, a fluorine atom, a methyl group, an ethyl group, a propyl group, and butyl, a trifluoromethyl radical, a perfluoro methyl group, a perfluoro ethyl group, and a perfluoro propyl group, a phenyl group, and a naphthyl group, like a general formula (2). even if R1 in a general formula (3) is mutually the same, it may differ. R3 is an alkylene group containing the partial saturation carbon hydrogen radical of the shape of lines, such as the Pori (alkyleneoxy) radical of the carbon atomic numbers 1–120 of the shape of lines, such as an alkylene group of the carbon atomic numbers 1–20 of lines, such as ethylene, a propylene radical, and a butylene radical, or the letter of branching, a poly(ethyleneoxy) group, and the Pori (propyleneoxy) radical, or branching, a pro PENIREN radical, a methyl pro PENIREN radical, and a butenylene radical, or branching, a carbonyl group, a carbonyl group, and an alkylene group which contains a carbamoyl group in the middle of a chain R3 [moreover,] — the following general formula — the radical of many ** chosen from the radical shown by (4 [–izing 4]), (5 [–izing 5]), and (6) [–izing 6] is sufficient.

[0011] a general formula — (4 [–izing 4]) is the following substituents.

[Formula 4]

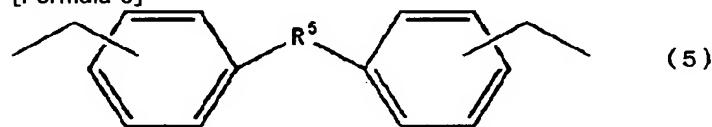


(4)

In a general formula (4), R4 is halogen atoms, such as an alkoxy group of 1–4 carbon atomic numbers, such as an alkyl group of 1–4 carbon atomic numbers, such as a hydrogen atom, a methyl group, an ethyl group, a propyl group, and butyl, a methoxy group, an ethoxy radical, a propoxy group, and a butoxy radical, a chlorine atom, and a bromine atom, a nitro group, a cyano group, a sulphydryl group, a low-grade alkyl carboxyl group, a carboxyl group, or a carbamoyl group, and X is the integer of 1–4.

[0012] a general formula — (5 [–izing 5]) is the following substituents.

[Formula 5]

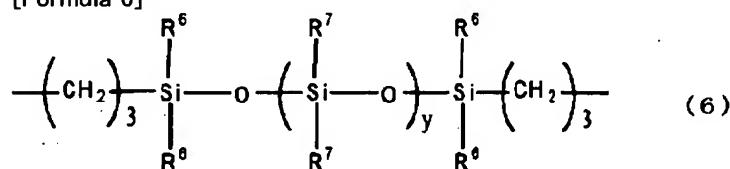


(5)

In a general formula (5), R5 is an oxygen atom, a sulfur atom, a methylene group, $-\text{NH}-$, $-\text{SO}-$, $-\text{SO}_2-$, $-\text{C}(\text{CF}_3)_2-$, or $-\text{C}(\text{CH}_3)_2-$.

[0013] a general formula — (6 [–izing 6]) is the following substituents.

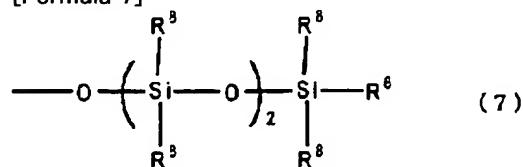
[Formula 6]



(6)

In a general formula (6), R6 is the aryl group of the carbon atomic numbers 6–18, such as a methyl group, an ethyl group, a propyl group, and butyl, and y is the integer of 0–200. R7 is the aryl group of the carbon atomic numbers 6–18, such as a methyl group, an ethyl group, a propyl group, and butyl. Moreover, the radical shown by the following general formula (7) is sufficient as R7.

[Formula 7]

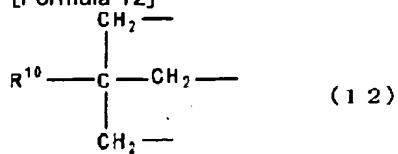


(7)

In a general formula (7), R8 is the aryl group of the carbon atomic numbers 6–18, such as a methyl group, an ethyl

by the following formula (15), is mentioned. j shows the integer of 3-10 equal to the valence of R9.

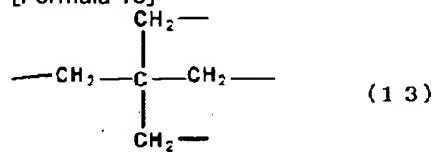
[Formula 12]



In a formula (12), R10 is the alkyl group of 1-6 carbon atomic numbers, such as a methyl group, an ethyl group, and a propyl group.

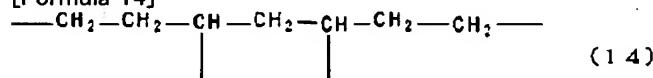
[0018]

[Formula 13]



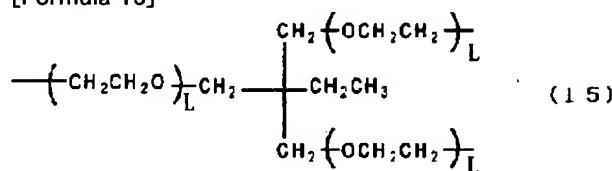
[0019]

[Formula 14]



[0020]

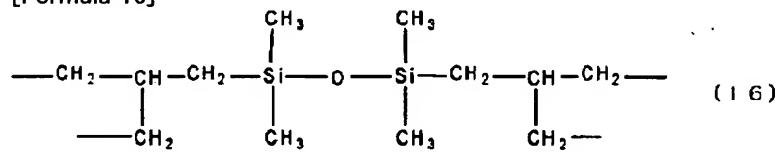
[Formula 15]



You may differ, even if L is the integer of 1-10 and it is mutually the same in a formula (15).

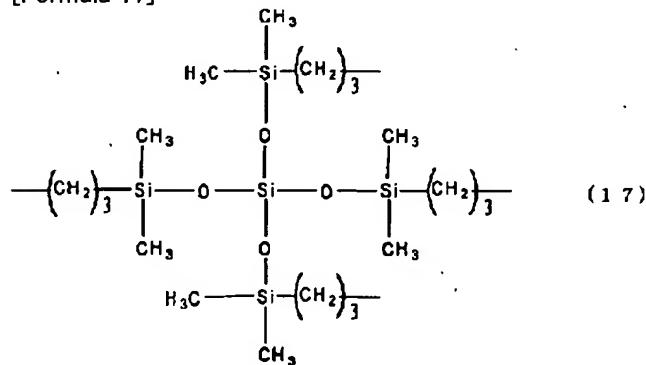
[0021]

[Formula 16]



[0022]

[Formula 17]



[0023] As an example of a compound of having an oxetane ring beyond <compound which has three or more oxetane rings> 3 piece, the compound shown by the following formula (18) and the general formula (19) is mentioned.

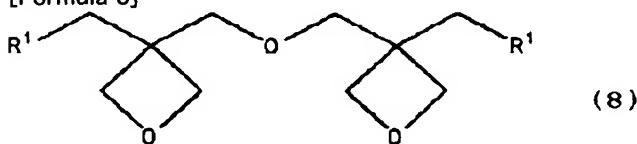
[0024]

[Formula 18]

group, a propyl group, and butyl. Z is the integer of 0-100.

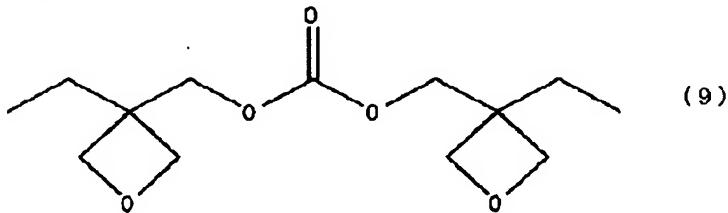
[0014] (Compound expressed with a general formula (8)) a general formula — the compound expressed with (8 [-izing 8]) is as follows.

[Formula 8]



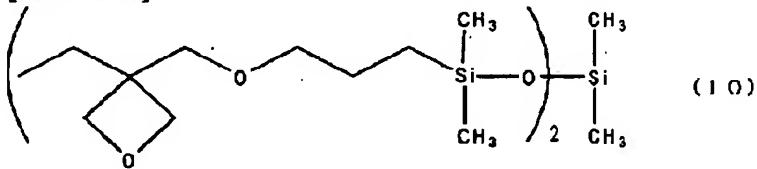
In a formula (8) R1 is the aryl group, furil radical, or thienyl group of the carbon numbers 6-18, such as a fluoro alkyl group of 1-6 carbon atomic numbers, such as an alkyl group of 1-6 carbon atomic numbers, such as a hydrogen atom, a fluorine atom, a methyl group, an ethyl group, a propyl group, and butyl, a trifluoromethyl radical, a perfluoro methyl group, a perfluoro ethyl group, and a perfluoro propyl group, a phenyl group, and a naphthyl group, like a general formula (2). even if R1 in a general formula (2) is mutually the same, it may differ.

[0015] as the compound which has two more concrete oxetane rings — the following formula — (9 [-izing 9]) and [Formula 9]



(-- 10) [-izing 10] is mentioned.

[Formula 10]

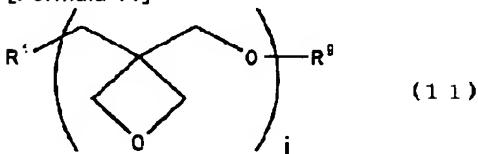


Furthermore, 3, a 7-screw (3-OKISETANIRU)-5-OKISA-nonane, 1, 4-screw [(3-ethyl-3-OKISETANIRUMETOSHIKI) methyl] benzene, 1, 2-screw [(3-ethyl-3-OKISETA nil methoxy) methyl] ethane, 1, 2-screw [(3-ethyl-3-OKISETA nil methoxy) methyl] propane, The ethylene glycol screw (3-ethyl-3-OKISETA nil methyl) ether, The JISHIKURO pentenyl screw (3-ethyl-3-OKISETA nil methyl) ether, The triethylene glycol screw (3-ethyl-3-OKISETA nil methyl) ether, The tetraethylene glycol screw (3-ethyl-3-OKISETA nil methyl) ether, The tricyclodecane diyl dimethylene screw (3-ethyl-3-OKISETA nil methyl) ether, 1, 4-screw [(3-ethyl-3-OKISETA nil methoxy) methyl] butane, 1, 6-screw [(3-ethyl-3-OKISETA nil methoxy) methyl] hexane, The polyethylene-glycol screw (3-ethyl-3-OKISETA nil methyl) ether, EO denaturation bisphenol A screw (3-ethyl-3-OKISETA nil methyl) ether, PO denaturation bisphenol A screw (3-ethyl-3-OKISETA nil methyl) ether, EO denaturation hydrogenation bisphenol A screw (3-ethyl-3-OKISETA nil methyl) ether, PO denaturation hydrogenation bisphenol A screw (3-ethyl-3-OKISETA nil methyl) ether, the EO denaturation bisphenol F screw (3-ethyl-3-OKISETA nil methyl) ether, etc. are mentioned.

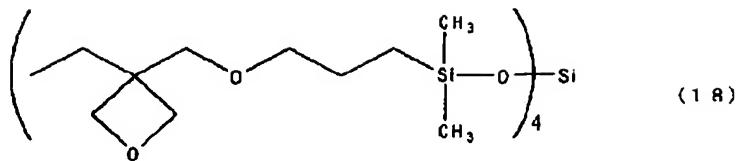
[0016] As a compound which has an oxetane ring beyond <compound which has three or more oxetane rings> 3 piece, the compound shown by the following general formula (11), (18), and (19) is mentioned.

[0017] (Compound expressed with a general formula (11)) a general formula — the compound expressed with (11 [-izing 11]) is as follows.

[Formula 11]



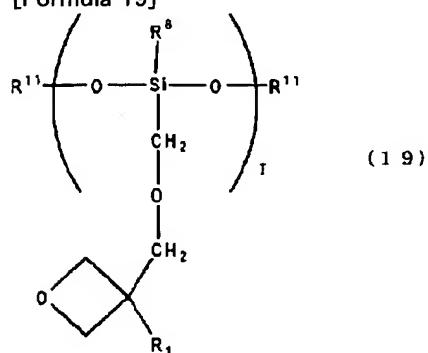
R1 is the aryl group, furil radical, or thienyl group of the carbon numbers 6-18, such as a fluoro alkyl group of 1-6 carbon atomic numbers, such as an alkyl group of 1-6 carbon atomic numbers, such as a hydrogen atom, a fluorine atom, a methyl group, an ethyl group, a propyl group, and butyl, a trifluoromethyl radical, a perfluoro methyl group, a perfluoro ethyl group, and a perfluoro propyl group, a phenyl group, and a naphthyl group, like a general formula (2). even if R1 in a general formula (11) is mutually the same, it may differ. A line or a branching-like polysiloxane content radical shown by a branching-like Pori (alkyleneoxy) radical, the following formula (16), or formulas (17), such as the shape of branching of the carbon atomic numbers 1-30, such as a radical which R9 shows the organic radical of 3 - 10 **, for example, is shown by following type (12) - (14), a linear alkylene group, and a radical shown



[0025] (Compound expressed with a general formula (19)) a general formula — the compound expressed with (19 [-izing 19]) has 1-10 oxetane rings, and is as follows.

[0026]

[Formula 19]

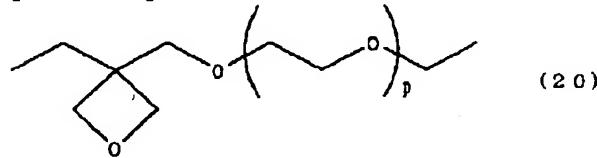


R1 is the aryl group, furil radical, or thienyl group of the carbon numbers 6-18, such as a fluoro alkyl group of 1-6 carbon atomic numbers, such as an alkyl group of 1-6 carbon atomic numbers, such as a hydrogen atom, a fluorine atom, a methyl group, an ethyl group, a propyl group, and butyl, a trifluoromethyl radical, a perfluoro methyl group, a perfluoro ethyl group, and a perfluoro propyl group, a phenyl group, and a naphthyl group, like a general formula (2). even if R1 in a general formula (19) is mutually the same, it may differ. R8 is the aryl group of the carbon atomic numbers 6-18, such as a methyl group, an ethyl group, a propyl group, and butyl, like [R8] a formula (7). Z is the integer of 0-100. at this time, even if R8 is mutually the same, it may differ. R11 is the alkyl group of the carbon atomic numbers 1-4, such as a methyl group, an ethyl group, a propyl group, and butyl, or the trialkylsilyl group (even if the alkyl group in a trialkylsilyl group is mutually the same, they may differ.) of the carbon atomic numbers 3-12. for example, they are a trimethylsilyl radical, a triethyl silyl radical, a TORIPURO pill silyl radical, a tributyl silyl radical, etc. — it is r shows the integer of 1-10. More specifically The trimethylol propane tris (3-ethyl-3-OKISETA nil methyl) ether, The pentaerythritol tris (3-ethyl-3-OKISETA nil methyl) ether, The pentaerythritol tetrakis (3-ethyl-3-OKISETA nil methyl) ether, The dipentaerythritol hexa kiss (3-ethyl-3-OKISETA nil methyl) ether, The dipentaerythritol pentakis (3-ethyl-3-OKISETA nil methyl) ether, The dipentaerythritol tetrakis (3-ethyl-3-OKISETA nil methyl) ether, The caprolactone denaturation dipentaerythritol hexa kiss (3-ethyl-3-OKISETA nil methyl) ether, the ditrimethylol propane tetrakis (3-ethyl-3-OKISETA nil methyl) ether, etc. are mentioned.

[0027] (The amount compound of macromolecules) As a compound (A) which has an oxetane ring, the compound which has the with a number average molecular weight [of the polystyrene conversion measured with gel permeation chromatography besides the above-mentioned example] of about 1000 to 5000 amount of macromolecules is also mentioned further. the following general formulas as such an example — (20 [-izing 20]), (21) [-izing 21], and the compound expressed with (22 [-izing 22]) are mentioned.

[0028]

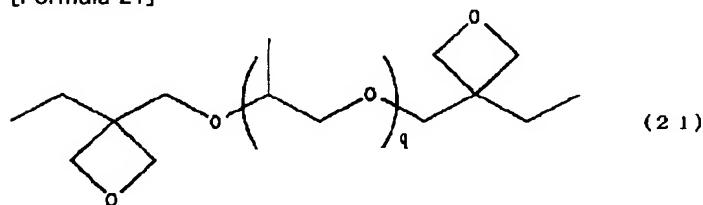
[Formula 20]



(Here, p is the integer of 20-200.)

[0029]

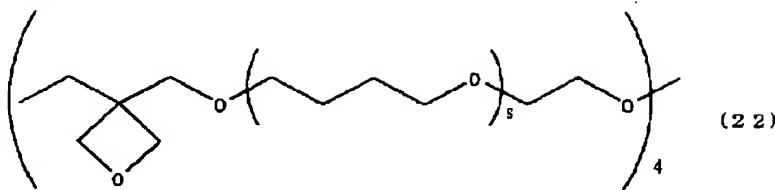
[Formula 21]



(Here, q is the integer of 15-200.)

[0030]

[Formula 22]



(Here, s is the integer of 20–200.)

[0031] the compound which has these oxetane rings is one-sort independent — it is — it can be used combining two or more sorts. The content rate of the (A) component in the resin constituent of this invention is usually the 30 – 100 weight section, and is 50 – 90 weight section preferably. (A) A component excels that they are more than 30 weight sections in photosensitivity, fast curability, etc. and is desirable.

[0032] By light, if the optical cation initiator (B) of [(B) light cation initiator] this invention is a compound which starts the cationic polymerization of the resin of the (A) component, especially limitation does not have it and either can be used for it. as the desirable example of an optical cation initiator — the following general formula — the onium salt which has the structure expressed with (23 [-izing 23]) can be mentioned. This onium salt is a compound which carries out the photoreaction and emits Lewis acid.

[0033]

[Formula 23]



(It is that R12, R13, R14, and R15 are the same or a different organic radical, and a cation is onium ion among a formula and (a+b+c+d) is [W is S, Se, Te P, As Sb, Bi O, I, Br, Cl, or N**N, and / a, b, c, and d are the integers of 0–3, respectively, and] equal to the valence of W.] M is the metal or metalloid which constitutes the neutral atom of a halogenation complex $[\mathbf{M} \mathbf{X}_{n+m}]$, for example, is B, P, As, Sb, Fe, Sn, Bi, aluminum, calcium, In, Ti; Zn, Sc, V, Cr, Mn, Co, etc. X is halogen atoms, such as F, Cl, and Br, m is the charge of the net of halogenide complex ion, and n is the valence of M.

In a general formula (23) as an example of onium ion Diphenyliodonium, 4-methoxy diphenyliodonium, screw (4-methylphenyl) iodonium, Screw (4-tert-butylphenyl) iodonium, screw (dodecyl phenyl) iodonium, TolyI cumyl iodonium, triphenylsulfonium, triphenylsulfonium, Diphenyl-4-thio phenoxyphenyl sulfonium, a screw [4-(diphenyl SURUFONIO)-phenyl] sulfide, Screw [4-(JI (4-(2-hydroxyethyl) phenyl) SURUHONIO)-phenyl] sulfide, eta5-2, and 4-(cyclo pen TAJIENIRU) [1, 2, 3, 4, 5, and 6-eta-(methyl ethyl) benzene]-iron (1+) etc. is mentioned. In a general formula (23), tetrafluoroborate, tetrakis (pentafluorophenyl) borate, hexafluorophosphate, hexafluoroantimonate, hexafluoroarsenate, hexa chloro antimonate, etc. are mentioned as an example of an anion. these optical cation initiators are one-sort independent — it is — it can be used combining two or more sorts. The content rate of the (B) component in the resin constituent of this invention is usually 0.1 – 10 weight section, and is 0.3 – 3 weight section preferably. (B) The hardening situation of a resin constituent becomes being more than the content rate 0.1 weight section of a component more good, it is desirable and below 10 weight sections are desirable from a viewpoint of prevention of an optical cation initiator of elution after hardening.

[0034] With [(C) Silane coupling agent] silane coupling agent, the silane compound which has reactant radicals, such as an epoxy group, a carboxyl group, a methacryloyl radical, and an isocyanate radical, is mentioned. Specifically, a trimethoxysilyl benzoic acid, gamma-methacryloxypropyl trimethoxy silane, vinyltriacetoxy silane, vinyltrimetoxysilane, gamma-isocyanato propyl triethoxysilane, gamma-glycidoxyl propyl TORIMETOSHI xylan, beta-(3, 4-epoxycyclohexyl) ethyl TORIMETOSHI xylan, etc. are mentioned. these (C) components are one-sort independent — it is — it can be used combining two or more sorts. The content rate of the (C) component in the resin constituent of this invention is usually 0.1 – 30 weight section, and is 0.3 – 20 weight section preferably. (C) Adhesive strength improves and is desirable when a component is made into 0.1 or more and 30 weight sections.

[0035] If the inorganic ion exchanger (D) of [(D) Inorganic ion exchanger] this invention can supplement with an anion, especially limitation does not have it and it can use all. For example, inorganic ion exchangers, such as a bismuth system, a bismuth and antimony mixed stock, an aluminum system, aluminum and a magnesium system, a zirconium system, a lead system, and a calcium system, are mentioned, and, more specifically, a water bismuth oxide nitrate, crystalline antimonic acid, lead hydroxyapatite, a zeolite, a silicate compound, etc. are raised. these (D) components are one-sort independent — it is — it can be used combining two or more sorts. The content rate of the (D) component in the resin constituent of this invention is usually 1 – 20 weight section, and is 1 – 10 weight section preferably. By carrying out more than 1 weight section, prehension of the anionic impurity of the photoinitiator origin becomes good, it is desirable and below 20 weight sections are desirable from a viewpoint of a rate of polymerization.

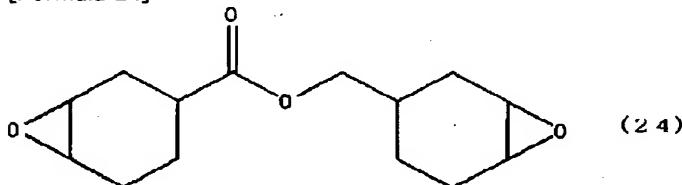
[0036] As for the resin constituent of [(E) particle silica] invention in this application, it is desirable to contain a particle silica (E). A particle silica is a silica whose pitch diameter of a primary particle is 5–100nm. Surface a non-processed thing, and the thing which carried out surface treatment can be used for a particle silica. As a particle silica which carried out surface preparation, the particle silica which carried out surface preparation by for example, methoxy-group-izing, the formation of a trimethylsilyl radical, the formation of an octyl silyl radical, or silicone oil is

mentioned. these (E) components are one-sort independent — it is — it can be used combining two or more sorts. The content rate of the (E) component in the resin constituent of this invention is usually 1 — 70 weight section, and is 1 — 30 weight section preferably. By using a particle silica together, the effectiveness of improving further moisture permeability-proof, adhesive strength, thioxotropy grant, etc. is acquired, and it is desirable.

[0037] As for the resin constituent of [(F) Compound which has epoxy group] invention in this application, it is desirable to contain the compound (F) which has an epoxy group. The following can be illustrated as a compound (F) which has an epoxy group. For example, as a compound which has one epoxy group, there are phenyl glycidyl ether, butyl glycidyl ether, etc., and hexanediol diglycidyl ether, tetraethylene glycol diglycidyl ether, trimethylolpropane triglycidyl ether, bisphenol A diglycidyl ether, a novolak mold epoxy compound, etc. are mentioned as a compound which has two or more epoxy groups. Moreover, the compound expressed with for example, the following type (24) and (25) is mentioned as a compound which has an alicyclic epoxy group.

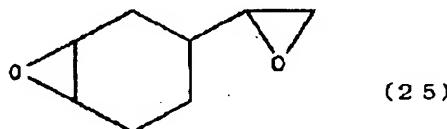
[0038]

[Formula 24]



[0039]

[Formula 25]



these (F) components are one-sort independent — it is — it can be used combining two or more sorts. The content rate of the (F) component in the resin constituent of this invention is usually 1 — 70 weight section, and is 1 — 50 weight section preferably. (F) Addition of a component is effective in making the adhesive property of a sealant, and thermal resistance improve.

[0040] In addition to this, a cationic polymerization nature compound, other resinous principles, a bulking agent, a modifier, a stabilizer, etc. can make the resin constituent of [other component] this invention contain a component in the range which does not spoil the effectiveness of this invention.

[0041] As a cationic polymerization nature compound besides cationic polymerization nature compound > besides <, an oxo-run compound, an annular acetal compound, an annular lactone compound, a thiirane compound, a thiethane compound, a SUPIRO orthochromatic ester compound, a vinyl ether compound, an ethylene nature unsaturated compound, a cyclic ether compound, an annular thioether compound, a vinyl compound, etc. are mentioned, for example. These may be independent one sort or may be used combining two or more sorts.

[0042] As a resinous principle besides resinous principle > besides <, a polyamide, polyamidoimide, polyurethane, poly swine JIEN, polychloroprene, a polyether, polyester, a styrene—swine JIEN—styrene block copolymer, petroleum resin, xylene resin, ketone resin, cellulosic resin, fluorine system oligomer, silicon system oligomer, polysulfide system oligomer, etc. are mentioned, for example. These may be independent one sort or may be used combining two or more sorts.

[0043] As a <bulking agent> bulking agent, a glass bead, talc, a styrene system polymer particle, a methacrylate system polymer particle, an ethylene system polymer particle, a propylene system polymer particle, etc. are mentioned, for example. These may be independent one sort or may be used combining two or more sorts.

[0044] As a <modifier> modifier, a polymerization initiation assistant, an antioxidant, a leveling agent, a wettability amelioration agent, a surfactant, a plasticizer, an ultraviolet ray absorbent, etc. are mentioned, for example. These may be independent one sort or may be used combining two or more sorts.

[0045] The photo-curing mold resin constituent for sealants of [adjustment of resin constituent] this invention mixes a class product to homogeneity, and it prepares it so that viscosity may become 0.01 — 300 Pa·s in 25 degrees C. Spreading workability can carry out more efficiently the viscosity range of 0.01 — 300 Pa·s. As for the viscosity range, it is more desirable that it is 0.1 — 100 Pa·s. What is necessary is just to adjust viscosity by adding the compounding ratio of resin, and other components. Moreover, what is necessary is just to knead with the conventional method of 3 rolls etc., when viscosity is high. Although the compounding ratio of each component can be suitably determined according to the physical properties to need Usually, they are the (A)/(B) / (C) / (D) =30 — 100 weight section / 0.1 — 10 weight section / 0.1 — 30 weight section / 1 — 20 weight section. furthermore — (— E —) — (— F —) — either — or — both sides — containing — things — desirable — the above — (— A —) — (— B —) — (— C —) — (— D —) — a presentation — receiving — respectively — (— E —) — one — 70 — weight — the section — (— F —) — one — 70 — weight — the section — it is . They are usually (A)/(B) / (C) / (D)=50 — 90 weight section / 0.3 — 3 weight section / 0.3 — 20 weight section / 1 — 10 weight section preferably. furthermore — (— E —) — (— F —) — either — or — both sides — containing — things — desirable — the above — (— A —)

-) -- (— B —) — (— C —) — (— D —) — a presentation — receiving — respectively — (— E —) — one - 30 - weight — the section — (— F —) — one - 50 — weight — the section — it is .

[0046] If the method of application to the display base material of the [seal approach] sealant can apply a sealant to homogeneity, there will be no limit in the method of application. For example, what is necessary is just to carry out by well-known approaches, such as the approach of applying using screen-stencil or a dispenser. Lamination and light are irradiated to a display base material after applying a sealant, and a sealant is stiffened. As the light source which can be used here, as long as it can make it harden within predetermined working hours, any are sufficient. Usually, the light source which can irradiate the light of the range of ultraviolet-rays light and the light is used. More specifically, a low pressure mercury lamp, a high pressure mercury vapor lamp, a xenon lamp, a metal halide LGT, etc. are mentioned. Moreover, although the exposure quantity of light can be suitably selected in the range where the non-hard spot of a resin constituent does not remain, or the range which an adhesive agent does not generate when too little [the exposure quantity of light], it is usually 500 - 3000 mJ/cm². Since unnecessary energy is wasted and productivity falls in being excessive although there is especially no upper limit of an exposure, it is not desirable.'

[Example] Hereafter, although the example of this invention is explained, this invention is not limited to these examples.

[0047] <Measuring method> The following evaluations were performed about the resin constituent and hardened material which were obtained.

(Viscosity) The viscosity of a viscosity resin constituent was measured with the rotation cone-disk viscometer at 25 degrees C.

(Bond strength) Bond strength inserts with a resin constituent (thickness of 100 micrometers), and it Mitsuteru-put and it pasted up the glass plate of two sheets. The bond strength when tearing off the glass plate of these two sheets was pulled, and the rate was measured by 2 mm/min.

(Moisture permeability) Moisture permeability is JIS. The moisture permeability of the resin constituent film (thickness of 100 micrometers) which carried out photo-curing according to Z0208 was measured.

(Corrosion test) With the ITO wiring glass substrate and the glass plate, it inserts, and it Mitsuteru-put and the resin constituent (thickness of 100 micrometers) was pasted up (drawing 1). Subsequently, the seal of approval of direct-current 10V was carried out to the ITO electrode, it was left for 50 days in 60 degrees C and 90%RH, and the condition of an ITO electrode was observed under the microscope after that.

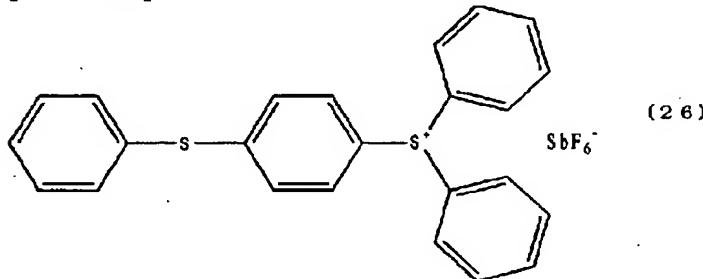
O :corrosion nothing, ** : corrosion is seen in part. x: Those with corrosion [0048] <Raw material> (compound which has an oxetane ring (A))

Oxetane a-1: 1, 4-screw [(3-ethyl-3-OKISETA nil methoxy) methyl] benzene oxetane a-2: 3-ethyl-3-hydroxymethyloxetane (optical cation initiator (B))

photoinitiator b-1: — a formula — the compound expressed with (26 [-izing 26]).

[0049]

[Formula 26]



[0050] (Silane coupling agent (C))

Silane coupling agent c-1:gamma-glycidoxyl propyl TORMETOSHI xylan (inorganic ion exchanger (D))

Inorganic ion exchanger d-1:IXE500 (Toagosei bismuth system inorganic ion exchanger)

Inorganic ion exchanger d-2:IXE550 (Toagosei bismuth system inorganic ion exchanger)

(Particle silica (E))

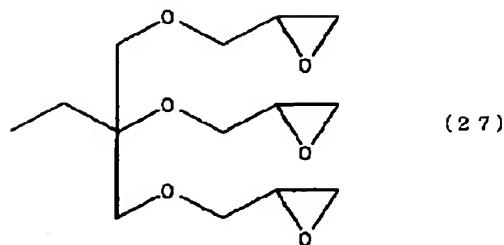
The surface unsettledness, particle silica whose pitch diameter of the e-1:1st particle silicas particle is 12nm.

(Epoxy compound (F))

epoxy compound f-1: — a formula — the compound expressed with (27 [-izing 27]).

[0051]

[Formula 27]



[0052] By the combination formula shown in the preparation table 1 of a <example 1> resin constituent, oxetane a-1 (1 and 4-screw [(3-ethyl-3-OKISETA nil methoxy) methyl] benzene) as a compound (A) component which has an oxetane ring 70 weight sections, A photoinitiator b-1 (formula (26)) as an optical cation initiator (B) component Three weight sections, A silane coupling agent c-1 (gamma-glycidoxyl propyl TORIMETOSHI xylan) as a silane coupling agent (C) component Three weight sections, The brown liquefied constituent was obtained by carrying out 5 weight sections combination and stirring an inorganic ion exchanger d-1 (IXE500 (Toagosei make)) as an inorganic ion exchanger (D) component, for 1 hour.

It was made to harden by performing the optical exposure of 3000 mJ/cm² with a photo-curing metal halide lamp. The result is shown in Table 2.

[0053]

[Table 1]
表1

	実施例			比較例		
	1	2	3	1	2	3
(A) 成分 オキセタ - 1	70	50	50	75	55	
(A) 成分 オキセタ - 2	19	19	19	19	19	
(B) 成分 光起始剤 b - 1	3	3	3	3	3	3
(C) 成分 ジンカッピング剤 c - 1	3	3	3	3	3	3
(D) 成分 無機イオン交換体 d - 1	5	5				
(D) 成分 無機イオン交換体 d - 2			5			
(E) 成分 微粒子シリカ e - 1		10	10		10	
(F) 成分 ホウキ化化合物 f - 1		10	10		10	94

[0054]

[Table 2]
表2

	実施例			比較例		
	1	2	3	1	2	3
粘度 (mPa·s)	110	2550	2400	75	2040	150
接着強度 (kgf/cm ²)	120	245	245	134	255	186
透湿性 (g/m ² ·24h)	23	19	19	23	19	56
腐食試験	○	○	○	△	△	×

[0055] It evaluated by preparing a resin constituent like the example 1 except having used the component of the presentation shown in the <examples 2 and 3> table 1. A result is shown in Table 2.

[0056] It evaluated by preparing a resin constituent like the example 1 except having used the component of the presentation shown in the <examples 1-3 of comparison> table 1. A result is shown in Table 2.

[0057]

[Effect of the Invention] It can excel in photosensitivity and fast curability, and the photo-curing mold resin constituent for sealants of this invention has an adhesive property, moisture permeability-proof, a water resisting property, and good thermal resistance, and there is little elution of an ionicity impurity and it can use it suitable for liquid crystal and an electroluminescence display. An adhesive property, moisture permeability-proof, a water resisting property, and thermal resistance can be held to stability especially under high-humidity/temperature for a long period of time.

[Translation done.]